UNIVERSITY OF SARGODHA

Office of the Registrar

Ref: SU/Acad/23/440
Dated: 18.05.2023

The Additional Controller of Examinations,
University of Sargodha,
Sargodha.

Subject: **SYLLABI OF BS 5TH TERM / SEMESTER INTAKE**

Please refer to letter No. SU/CE/Secrecy-P.S/95 dated 06.04.2023 on the subject cited above.

2. This is to inform you that your kind letter has been analyzed thoroughly and Syllabi of various programs of BS 5th Term/Semester Intake w.e.f. Spring 2023 have been returned to the concerned departments with the relevant observations mentioned in your letter for rectification at the earliest.

3. In this regard, after removing the observations, following departments have updated and forwarded correct/vetted copies of Syllabi of BS 5th Semester Intake **(Annex-'A' & 'B')** through the office of Director Academics.

i. Earth Sciences
ii. Computer Science & IT

4. The same has also been forwarded through e-mail at controller.exam@uos.edu.pk as desired. The remaining Syllabi will be furnished to your kind office as and when received from quarter concerned.

5. Further necessary action may be taken accordingly.

Asif Mehmood 18/05/23
Deputy Registrar (Acad)

CC:

- Director Academics
- Director QEC
- Director Implementation
- Deputy Registrar (Affiliation)
- Deputy Registrar (Registration)
- Secretary to the Vice Chancellor
- P.A to Registrar

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CURRICULUM
OF
BS-Geography

(5th Semester Intake)

W.e.f Spring Semester 2023 & onward

UNIVERSITY OF SARGODHA

CHAIRMAN
Department of Earth Sciences
UNIVERSITY OF SARGODHA
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Table of Contents

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Program Introduction:

Geography is the study of Earth, its structure, features, inhabitants and man environment interaction. BS geography helps students to study and investigate earth. The students, who have studied Geography as elective subject in their ADA/ADS/ADP/BA/BSc are eligible to apply for this program. After completion of their degree, students will be able to understand the recent perspective of Geography including man environment relationship, spatial variations resulting from physical and human phenomena and relationship of Geography with other disciplines of allied sciences.

Program Objectives:

- ✓ To develop understudying of physical and human activities on the surface of earth.
- ✓ To impart current knowledge and practical skills to Geography graduates through theory, practical and field excursion.

Teaching Methodology:

- ✓ Sourcing and preparation of teaching materials
- ✓ Delivery of effective lessons
- ✓ Effective management of the classroom
- ✓ Problem-Comparative-Thinking Based Learning
- ✓ seminars or/ tutorials
- ✓ independent Study
- ✓ Problem-based learning
- ✓ Fieldwork or field trips

Assessment Criteria:
Following assessment criteria is followed by the University for each Course.

Practical Course				Non Practical Course		
Mid Term	**Sessional**	**Practical**	**Final Term**	**Mid Term**	**Sessional**	**Final Term**
15	15	25	45	30	20	50
Total 100				**Total 100**		

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ELIGIBILITY & DEGREE DETAILS

Intake/Admission Criteria	45% marks in ADA/ADS/ADP/BA/BSc with Geography as elective subject.
Total numbers of Credit hours	69
Duration	2-Years
Semester duration	16-18 weeks
Number of Semesters	4
Course Load per Semester	15-18 Cr hr
Number of courses per semester	4-6 (not more than 3-lab /practical courses)

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Scheme of Studies BS Geography
(5th Semester Intake)
Total Credit Hours = 69

Semester/Term-I

Course code	Course Title	Cr.Hrs
GEOG-6301¥	Geography: Histroy & Concept	3(3+0)
GEOG-6302	Regional Concepts	3(3+0)
GEOG-6303	Geomorphology	3(3+0)
GEOG-6304	Climatology	3(3+0)
GEOG-6305	Quantitative Methods In Geography	3(3+0)
GEOG-6306	Principles of Cartography	3(1+2)
Total		**18**

¥ Deficiency Course

Semester/Term- II

Course code	Course Title	Cr.Hrs.
GEOG-6307	Economic Geography	3(3+0)
GEOG-6308	Oceanography	3(3+0)
GEOG-6309	Remote Sensing	3(2+1)
GEOG-6310	Research Methods	3(3+0)
GEOG-6311	Population Geography	3(3+0)
GEOG-6312	Geographical Information System	3(2+1)
URCC-5110	Citizenship Education and Community Engagement	Non 0(0-0) Cr.Hrs.
Total		**18**

Semester/Term-III

Course code	Course Title	Cr. Hrs.
GEOG-6313	Environmental Geography	3(3+0)
GEOG-6314	Urban Geography	3(3+0)
GEOG- 6315	Digital Image Processing	3(2+1)
GEOG-6370	South Asia	3(3+0)
*GEOG-63--	Elective Course	3(3+0)
*GEOG-63--	Elective Course	3(3+0)
TOTAL		**18**

Semester/Term-IV

Course code	Course Title	Cr.Hrs
GEOG-6316	Geography of Pakistan	3(3+0)
*GEOG-63--	Elective course	3(3+0)
*GEOG-63---	Elective Course	3(3+0)
***GEOG-63--	Field Survey	6(0+6)
GEOG-6390	Thesis (in lieu of two elective courses)	6(0+6)
TOTAL		**15**

* as notified by the Chairman from list A.

*** as notified by the Chairman from list C.

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List A: Elective Papers:-

- GEOG-6322 Cultural Geography
- GEOG -6323 Natural Hazards & Disaster Management
- GEOG-6324 Geography of Manufacturing
- GEOG-6325 Hydro Geography
- GEOG-6326 Medical Geography
- GEOG-6327 Political Geography
- GEOG-6328 Regional Planning & Development
- GEOG -6329 Climate Change Studies
- GEOG-6330 Agricultural Geography
- GEOG-6331 Conservation of Resources

Regional Geography:-

- GEOG-6370 South Asia

List C. Field Survey Report

The students shall carry out field survey on any one of the following fields:

- GEOG-6380 Demographic Survey
- GEOG-6381 Hydrological Survey
- GEOG-6382 Industrial Survey
- GEOG-6383 Land Use Survey
- GEOG-6384 Landforms Survey
- GEOG-6385 Soil Survey
- GEOG-6386 Urban Survey
- GEOG- 6387 EIA (Environmental Impact Assessment)

Each student shall be required to collect data/information pertaining to his/her topic in a selected area/region, tabulate the data and write report on it.

GEOG-6390: Thesis

(In lieu of two elective courses in semesterIV

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GEOG- 6301 **Geography: History & Concepts** **3(3+0)**

This course surveys the major traditions of geographic thought from the early 20th century to present. Attending to both 'human' and 'physical' perspectives in the discipline - as well as those that blur the lines between the social and natural sciences - we will explore the changing, contested nature of geographic knowledge in terms of its situated, historical contexts and its numerous reformulations in contemporary practice. The development of geographic thought from Greek times to the present, the contradictions and shifting positions in the geographic perspective prior to the development of the scientific method, and the contributions of the Greeks, Romans and Muslims to the development of Geographic Thought. In so doing, the course provides students with the background for understanding their research in terms of the philosophies and methods, and the convergences and departures that constitute the intellectual history of the discipline in general, and Geography at Madison in particular.

Contents

1. Geography Through Ages
   - i. A general survey of the geographical work of Greeks and Romans.
   - ii. Muslim contribution to Geographic Thought.
   - iii. European Renaissance. Geographic Thought in the Humboldt and Ritter era.
   - iv. Ideas of Ratzel and Vidal de la Blache
2. The Environmental Challenge
   - i. Environment of Eco-Systems
   - ii. The Global Environment
   - iii. Environmental risks and uncertainties.
3. Human Ecological Response
   - i. The Human Population
   - ii. Our role in changing the face of the earth
4. Regional Mosaics
   - i. Cultural Fission: Toward Regional Divergence
   - ii. World Cultural Regions: The Emerging Mosaic
   - iii. Spatial diffusion: Toward regional convergence
5. The Area-analysis Tradition in Geography
   - i. Urbanization: Origin Pattern and Factors of Urbanization
   - ii. City Chains and hierarchies, Territories and boundaries
   - iii. Rich countries and poor, Inequalities between countries
6. Future Tasks in Geography
   - i. New Directions in Geography
     Automated Cartography, GIS, Remote Sensing, GPS

Recommended Texts

1: Dikshit R.K. (1998). *Geographical Thought*. Prentice Hall, India

2: Ahmad, K.S., (latest edition). *Geography through the Ages*. PGR. Karachi.

Suggested Readings

1. Ayhew, S. (2008). *Geography*. Harmonds Worth: Penguin London.
2. Mitchel, B. (latest edition). *Geography and Resources Analysis*.
3. Tim, U. (1992). *The Place of Geography*, Longman, London.

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GEOG -6302 **Regional Concepts** **3(3+0)**

Regional geography is a major branch of geography. It focuses on the interaction of different cultural and natural geo-factors in a specific land or landscape, while its counterpart, systematic geography, concentrates on a specific geo-factors at the global level. By the end of this course, the student will be able to describe what are geography and regional Geography and also major cultural region of the world. It focuses on major physical region and briefly explains major historical events and the impact of these events on World Geography. Students will get an introduction to the main regions of the world in terms of both their uniqueness and similarities. They will thus gain a perspective about social and cultural diversity of the world. Students will learn the relationships between the global, the regional and the local, particularly how places are inserted in regional and global processes. Students will be exposed to historical, economic, cultural, social and physical characteristics of regions, notably how they came to be, their main role and function and how they are changing. Students will see how human activities and the regional environment interact, particularly how societies reflect their regional environment.

Contents

1. Introduction to Regional Concepts
2. Scope, Status, and the significance of the regional approach, Regional approach and its evolution
3. Criteria for dividing world into regions
4. Physical Attributes: Location, Physiography, Climate, Soils, Hydrology and Natural Vegetation
5. Economic attributes: Human Resources, Mineral and Power resources, Agriculture, Industry, Communication and Trade
6. Types of Regions
7. Physical Regions, Economic Regions, Political Regions, Cultural Regions
8. Special Purpose Regions
9. Major Regions of the world
10. Role of the Region in Global Development

Lab. Work

Identification and delimitation of different types of regions on maps

Recommended Texts

1. Bradshaw, M. & White, G. W. (2007). *Contemporary world regional geography: global connections, local voices*. Boston: McGraw-Hill.
2. Deblij, H. J. D & Muller, P. O. (2011). *The world today: concepts and regions in geography* . New York : John Wiley & Sons.

Suggested Readings

1. Hobbs, J. (2010). *Fundamentals of world regional*. Boston: Cole Cengage learning.
2. Knox, P. L. & Marston, S. A. (2003). *Places and regions in global context: human* geography. New Jersey: Prentice Hall.
3. James. & Preston, E. (2000). *One world divided*. New Jersey: Prentice Hall.

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GEOG -6303 **Geomorphology** **3(3+0)**

Geomorphology is the study of landforms, their processes, form and sediments at the surface of the Earth (and sometimes on other planets). Study includes looking at landscapes to work out how the earth surface processes, such as air, water and ice, can mold the landscape. Landforms are produced by erosion or deposition, as rock and sediment is worn away by these earth-surface processes and transported and deposited to different localities. The different climatic environments produce different suites of landforms. The landforms of deserts, such as sand dunes and ergs, are a world apart from the glacial and periglacial features found in polar and sub-polar regions. So geomorphology is a diverse discipline. Although the basic geomorphologic principles can be applied to all environments, Geomorphologists tend to specialize in one or two areas, such Aeolian (desert) geomorphology, glacial and periglacial geomorphology, volcanic and tectonic geomorphology, and even planetary geomorphology. Most research is multi-disciplinary, combining the knowledge and perspectives from two contrasting disciplines, combining with subjects as diverse as ecology, geology, civil engineering, and hydrology and soil science.

Contents

1. Scope and status of geomorphology
2. Introduction to geomorphic concepts/principles
3. Factors of landform development; structure, process and geological time scale
4. Endogenic Processes
5. Isostasy
6. Diastrophism
7. Continental drift
8. Plate tectonic
9. Volcanism
10. Earthquakes
11. Exogenic Processes
12. Weathering; mass wasting and their types
13. Cycle of erosion: fluvial , glacial, eolian and Karst
14. Fluvial Erosional landforms, transportation mechanisms of running water: fluvial depositional landforms, types of drainage patterns and structure
15. Glacier formation, glacier as geomorphic agent: glacial erosion and depositional landforms; glacio-lacustrine and glacio-fluvial features
16. Eolian landforms: wind as geomorphic agent; eolian erosional landforms, transportation by wind; Eolian depositional landforms
17. Ground water: porosity and permeability of rocks; aquifers
18. Karst topography and associated landforms
19. Sea wave as geomorphic agent; erosional and depositional landforms
20. Soil development

Recommended Texts

1. Thompson, G. R., & Turk, J. (1998). *Introduction to physical geology*. Brooks/Cole Publishing Company.
2. Thornbury, W. D. (2004). Principles of geomorphology. New York: John Willy & Sons.

Suggested Readings

1. Englen O.D.V. (2000). *Geomorphology*. New York: Macmillan.
2. Stringer, E. T. (2004). *Modern physical geography*. New York: John Wiley.

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GEOG – 6304 **Climatology** **3(3+0)**

The course provides an overview of the physical processes responsible for determining global and regional climate. This course gives a general introduction to meteorology and climatology. Meteorology topics include energy balance, moisture and cloud development in the atmosphere, atmospheric dynamics, small and large scale circulations, storms and cyclones, and weather forecasting. Climatology topics include the interaction between the atmosphere and oceans over long time periods, climate classification, and the potential for climatic change. It brings together information from rural communities, indigenous peoples and research workers on how they use agro-biodiversity to cope with climate change. It stimulates communication between agro-biodiversity researchers, users and maintainers. It identifies tools and practices relevant to using agro-biodiversity for coping with climate change and making these widely available. It also promotes awareness of the vital role of agro-biodiversity in adapting to climate change among key audiences, including donors, development agents and the global biodiversity community.

Contents

1. Introduction.
2. Key concepts in climatology and meteorology.
3. Structure and composition of atmosphere.
4. Elements and factors of climate.
5. Insolation and Terrestrial heat budget.
6. Temperature distribution.
7. Humidity and its types; Condensation and their forms, Precipitation, formation and their types.
8. Atmospheric Pressure and global pressure belts.
9. Atmospheric Circulation: (Upper and Lower) air stability and instability, storms; Cyclones (hurricanes, typhoons) and tornadoes
10. Air masses and fronts.
11. Classification of climates; critical study of the Koppen, Miller and Thornthwaite classifications of major climates.
12. Climate variability and climate change: Natural and anthropogenic; Greenhouse gasses; global warming; acid rain, ozone layer depletion El-Niño and La-Niña, impact on precipitation distribution.
13. Climatic regions of Pakistan and their characteristics
14. Climatic data: sources, collection, analysis and presentation. Problems associated with data quality (spatial, temporal).
15. Lab. Work Recording and analysis of weather data, interpretation of weather maps and synoptic charts. Visit to local office of Pakistan Meteorological Department and hands on exercises.

Recommended Texts

1. Miller A. (2001). *Climatology*. Haryana: Shubhi Publications.
2. Barry, R. (1998). *Atmosphere, weather and climate*. London: Routledge.

Suggested Readings

1. Shamshad, K.M. (1988). *The meteorology of Pakistan*. Karachi: Royal Book Co.
2. Strahler, A. N. (1998). *Elements of physical geography*. New York: John Wiley.
3. Diwan A. P. & Arora. D. K. (1995). *Origin of ocean*. New York: John Wiley.

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GEOG - 6305 **Quantitative Methods in Geography** **3(3+0)**

To train students in collection, analysis, interpretation and presentation of quantitative spatial data and to enable them to organize and conduct independent research.To use database software for the analysis of both Spatial and Temporal data.Quantitative techniques are the techniques that are concerned with collection, organization, presentation, analysis and interpretation of data. The quantitative techniques in geography are a recent development. The hard numbers behind any good research project are called quantitative data. Quantitative data is the language of science. It uses mathematical models, theories, and hypotheses. Quantitative data and qualitative data, in which you observe the non-numerical qualities of your subject, go hand-in-hand.

Contents

1. Introduction
2. Quantitative revolution and its impact on Geography
3. Parametric and non-parametric statistics
4. Nature of geographical data and measurement scales.
5. Data summarizing techniques
6. Theory of central tendency
7. Dispersion
8. Variability.
9. Time Series: graphs, growth and decline, index numbers, logarithmic scales, trends and fluctuations
10. Components of time series.
11. Methods of drawing trend lines for linear and exponential series scatter diagrams
12. Standard errors and probability, correlation and regression.
13. Quantitative models in Geography

Lab. Work

1. Introduction to EPI-Info SPSS E-view, MS Excel, MiniTab and other relevant software database for quantitative analysis.

Recommended Texts

1. Haring, L. L. (2002). *Introduction to scientific geographic Research.* Oxford: ECB.
2. Levin, J. (2006). *Elementary statistics in social research.* New Delhi: Pearson.

Suggested Readings

1. Matthew, H. & Foster, I. (2001). *Geographical data. sources, presentation and analysis.* London: Oxford University Press.
2. Mckillup, S. & Melinda, D. D. (2010). *Geostatistics explained.* Cambridge: Cambridge University Press.
3. Walford, N. (2011). *Practical statistics for geographers and earth Science.* Singapore: Wiley-Blackwell.

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GEOG -6306 **Principles of Cartography** **3(1+2)**

Cartography or mapmaking is the study and practice of making representations of the Earth on a flat surface. The discipline of cartography combines science, aesthetics, and technical ability to create a balanced and readable representation that is capable of communicating information effectively and quickly. Cartography is a complex, an ever-changing field, but at the center of it is the map-making process. Viewed in the broadest sense, this process includes everything from the gathering, evaluation and processing of source data, through the intellectual and graphical design of the map, to the drawing and reproduction of the final document. As such, it is a unique mixture of science, art and technology and calls for a variety of in-depth knowledge and skills on the part of the cartographer.

Contents

1. Evolution of Cartography
2. Basic geodesy, spherical, ellipsoidal and geoidal earth, geographical and planer.
3. Coordinates, properties of the graticule and geodetic position.
4. Map projections: Major types, merits and demerits of commonly used map projections.
5. Map Datum
6. Symbolization, symbol types and graphic variables
7. The symbolization problems, symbolizing graphic features.
8. Lettering principles.
9. Mapping statistical surfaces
10. Thematic map, choropleth, dot map, isolines, area cartograms.
11. Principles of cartographic design, general design problems; design of map symbols
12. Basic procedure and designing of the thematic maps such as topographic, climatic, economic, population, settlements, urban morphology etc.
13. Map production, form of map output, construction material, output options, composing separations, proofing.
14. Introduction to Digital Cartography
15. Terrain data (Digital Elevation Model/ Digital Terrain Model)

Recommended Texts

1. Singh, G. (2009). *Map work and practical geography*. Karachi: Vikas Publishing House Pvt Ltd.
2. Singh. L. & Raghu naadam, S. (2000). *Map work and practical Geography*. New Delhi: kalyani publishers.

Suggested Readings

1. Ahmad. Z. (1998). *Text book of Practical geography*. Cambridge: Cambridge University Press.
2. Bygott, J. (2000). *An introduction to mapwork and practical geography*. University Tutorial Press.
3. Bygott, J. (2000). *Mapwork and practical geography*. New Dehli:University Tutorial Press.

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GEOG - 6307 **Economic Geography** **3(3+0)**

This course provides an introduction to economic geography. This course is an introduction to the theories, concepts, methods and data used by geographers to analyze the location of economic activities, the spatial organization of economic systems, the human use of the earth's resources and environmental issues. Topics studied include agriculture, manufacturing, transportation, retailing, urban structure, spatial diffusion and economic development.The course explores processes driving spatial patterns of economic activity at the global, national, regional, and local scales. Topic areas include economic globalization, spatial distribution of industrial sectors, multinational corporations, international trade, regional economic development, and illegal economic activities. The course looks at the development of the global marketplace in both the developed and the developing world. After the completion of this course student will be able to understand the significance of geographic concepts for socio-economic processes and the dynamics of the world economy, man's resource use and the pressure that population puts on the resource base.

Contents

1. Introduction (Definition ,Scope, Approaches to Study Economic Geography)
2. Branches of Economic Geography
3. Relationship with other Branches of the Geography
4. Producer and Consumer
5. Decision Making
6. Man Against Nature
7. Comparative Advantage
8. Perception
9. Evolution of world economic systems: Medieval feudal economics, economic impacts of colonialism. Modern world economic systems
10. Concept of natural resources and reserves
11. Human resource and its development
12. Classification of economic activities
13. Primary activities; gathering, hunting, herding
14. Subsistence, Intensive and extensive farming, commercial grain farming
15. Livestock farming, dairying, mixed farming, plantation farming, lumbering, fishing and mining
16. Green revolution and its implications
17. Secondary activities: Industrial revolution and manufacturing industries
18. Tertiary activities
19. Quaternary and Quinary activities
20. Regional inequalities, sustainable development and poverty alleviation
21. Impacts of Globalization

Recommended Texts

1. Aoyama, Y., James T. M. & Susan H. (2012). *Key concepts in economic geography*. Singapore: SAGE.
2. Boyce, R. R. (2000). *The basic of economic geography*. New York: Holt, Rinehart & Winston.

Suggested Readings

1. Khan, F.K. (1998). *An introduction to economic geography*. Karachi: Oxford Publishers.
2. Knox, P & Agnew, J. (2008). *The geography of the world economy*. London: Edward Arnold.
3. Alnwick, H. (2012). *A geography of commodities*. London: Harrap.

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GEOG - 6308 **Oceanography** **3(3+0)**

It describes knowledge about world's oceans their distribution, and its resources. To produce the students with the applicable knowledge about existence of oceans, formation of ocean floors, their distribution and effects of climate and ocean resource management. It may identify the impact of basic and applied knowledge of oceanography, to impart skills on the ocean distribution, existence of oceans, and availability of resources in oceans. It discusses the spatial distribution of oceans and their effects Land, Ocean and atmosphere relationship, to study ocean currents, variability, and Mechanism. It will also discuss the law of sea and country rights for associated oceans and seas. It will discuss the ocean habitat to study the ocean resources and law of ocean territory.

Contents

1. Introduction
2. Origin of oceans and seas
3. Major water masses and their distribution.
4. Morphology of the ocean basins.
5. Ocean floor deposits.
6. Their characteristics and classification.
7. Temperature, salinity and density of ocean water
8. Distribution, causes and effects
9. Oceanic circulation: waves, currents and tides, their nature, causes, effects and impact on environment.
10. Special phenomena: tropical storms; Tsunami.
11. Oceanography of Arabian Sea with special reference to Exclusive Economic Zone.

Lab. Work

Drawing features of the Ocean floor, mapping of the ocean currents, tides and associated phenomena.

Recommended Texts

1. Douglas A. Segar. (1998). *Ocean sciences*. Boston: Wadsworth publishing Company.
2. Barnes, H. (2000). *Apparatus & methods of oceanography*. London: George Allen &Unwin Ltd.

Suggested Readings

1. Duxbury, A.B & Duxbury, A.C. (1994). *An introduction to the world oceans*. Oxford: WMC Brown Publishers.
2. King, C.A.M. (2000). *Oceanography for geographers*. London: Edward Arnold Publishers, Ltd.
3. Pinet, P.R. (2002). *Invitation to oceanography*. London: Jones & Bartlett Publishers.

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GEOG -6309 **Remote Sensing** **3(2+1)**

It describes about knowledge of Remote Sensing (RS) and its practical implementation. To produce students, that has applicable knowledge about basic tools of GIS. The course aims to equip students with an understanding of GIS, evolution and applications of spatial data through Geo-spatial technologies. Remote sensing is the process of detecting and monitoring the physical characteristics of an area by measuring its reflected and emitted radiation at a distance from the targeted area. Special cameras collect remotely sensed images of the Earth, which help researchers "sense" things about the Earth. It introduces knowledge of recording earth's surface features from space-borne platforms and different ways in which images can be analyzed. It will enable students to develop an understanding of common remote sensing products such as, earth resources satellite images, aerial photographs etc to develop a comprehension regarding ground-truthing aided by GPS.

Contents

1. Introduction
2. History and Development
3. Concepts and Foundation of Remote Sensing and Electromagnetic spectrum
4. Visible Spectrum, Colour Theory
5. Atmospheric Attenuation
6. Types of Remote Sensing Systems
7. Type of Sensors
8. RBV, MSS, TM,HRV, HRPT/APT/AVHRR, MODIS (Terra and Aqua) non-imaging systems (RADAR)
9. Types of Satellites
10. Telecommunication, Spy, Scientific etc.)
11. Platforms (Orbits)
12. Ground Receiving Stations (Reception of Data)
13. Image Processing
14. Global Positioning System (GPS)
15. Applications of Remote Sensing
16. Remote Sensing in Pakistan: Potential and Prospects.

Lab. Work

Interpretation of aerial photographs, various sensors data comparison, thermal infrared image interpretation, introduction to ERDAS imagine, display, geo-linking, identification of targets, field trips.

Recommended Texts

1. ITC (2004). *Principles of remote sensing*. Netherlands: ITC Educational Textbook Series.
2. Campbell, J. B. & Wynne, R. H. (2011). *Introduction to remote sensing*. New York: Guilford Press.

Suggested Readings

1. Iliffe, J. & Lott, R. (2008). *Datums and Map Projections for remote sensing, GIS, and Surveying* (2nd ed.). Manchester: Whittles Publishing.
2. Jensen, J. (2005). *Introductory remote sensing: Principles and Concepts*. New York: Freeman & Co.
3. Jensen, J. R. (2011). *Remote sensing of the environment: an earth resource perspective*. New Jersey: Prentice Hall.

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GEOG- 6310 **Research Methods** **3(3+0)**

The purpose of research is to discover answers to questions through the application of scientific procedures. The main aim of research is to find out the truth which is hidden and which has not been discovered as yet. Each research study has its own specific purpose, we may think of research objectives are: to create awareness among students regarding basics of geographical research. To gain familiarity with a phenomenon or to achieve new insights into it (studies with this object in view are termed as exploratory or formulative research studies); To portray accurately the characteristics of a particular individual, situation or a group (studies with this object in view are known as descriptive research studies); To determine the frequency with which something occurs or with which it is associated with something else (studies with this object in view are known as diagnostic research studies); To test a hypothesis of a causal relationship between variables (such studies are known as hypothesis-testing research studies).

Contents

1. Introduction Research approaches
2. Research paradigms in Geography
3. Types of research: historical research, qualitative/descriptive research, quantitative/experimental research
4. Research design; research topic, formulation and statement of a problem, research questions, research hypotheses, research objectives, research plan
5. Literature review; Literature sources: Journals (types) Books, Monographs and web sources
6. Data collection, universe and sampling: primary and secondary data, sources of data
7. Selection of a sample and measuring instruments, basic considerations in sampling, size of sample, geo-statistical
8. considerations, Sampling units and design; points, traverses, random sampling, stratified sampling, systematic sampling
9. Field Techniques
10. Data analysis and interpretation: pre-analysis considerations,
11. Preparing data for analysis: use of the descriptive statistics and quantitative methods.
12. Data presentation
13. Research report writing; Proposal and Synopsis writing
14. Bibliography and references

Recommended Texts

1. Therese, L. B. (1999). *Doing social research*. Boston: McGraw Hill.
2. Nicholas J. Clifford & Gill V. (2003). *Key methods in geography*. London: Sye Publications.

Suggested Readings

1. Keith Hoggart, Loretta Lees & Anna Davies (2002). *Researching human geography*. London: Arnold Publishers.
2. Dr. K. L. Narasimha Murthy (1992). *Research in geography: a survey*1st Ed.: Ashish Publishing House, New Delhi.
3. John W. Best & James V. Kahn, (2003). *Research in education*. New Dehli: Printice Hall Private Ltd.

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GEOG - 6311 **Population Geography** **3(3+0)**

This course introduces population geography to advanced undergraduate students, and graduate students. We will examine how and why aspects of population have been understood as 'problems' in different and times. he syllabus coverts the major concepts and basic tools of demography; key geographical and historical processes of population change such as fertility, mortality and migration; and the socio-economic, political, and environmental causes and consequences of population dynamics in different world regions and over time. The population dynamics are discussed in a way that incorporates economic, political, cultural and environmental issues. To develop this critical geographic approach to population issues, we will places examine trends in population, population patterns at several scales (global, national, urban) and the population processes (fertility, mortality, migration) that create them. Further, we will investigate how population processes are shaped by, and engender, larger processes of political, environmental, urban, economic, and cultural change.

Contents

1. Introduction
2. Population theories
3. Sources and methods of population data collection and associated problems
4. Population distribution
5. Density
6. Urban and rural population
7. Population composition
8. Gender composition
9. Age structure, marital status, families and households, languages, religions, ethnic groups etc.
10. Population dynamics
11. Patterns of fecundity and fertility
12. Morbidity and mortality
13. Migration and its types
14. Demographic transition
15. Population growth and change
16. Population Projections

Lab Work

Consultation of the Population Census of Pakistan and representation of population data on maps.

Recommended Texts

1. Newbold, K. B. (2017). *Population geography: tools and issues*. Toronto: Rowman & Littlefield.
2. Ardagh, M. (2013).*Textbook of population geography*. New Delhi: Random Exports.

Suggested Readings

1. John. I. C. (1997). *Population geography*. Toronto: Rowman & Littlefield.
2. Majid, H. (1994). *Population geography*. Karachi: Anmol Publications
3. Polunin, N. (1998). *Population and global security*. Cambridge: Cambridge University Press.

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GEOG -6312 **Geographical Information System** **3(2+1)**

The course aims to equip students with an understanding of GIS, evolution and applications of spatial data. In this class, students will be introduced to the study and design of maps, primarily through the application of a specialized computer mapping software program known as a Geographic Information System (GIS). GIS is a map-based computer decision support system that allows for the investigation of geographic data relationships. People that are trained in GIS are in high demand today, both in government and private industry. The lecture sessions in this class will focus primarily on GIS-based mapmaking techniques, including map design, symbology, map coordinates and georeferencing systems. Students will cover many important aspects of mapmaking, including map data collection and processing, field methods and GPS, cartographic communication, topographic map reading and analysis, and qualitative and quantitative mapping techniques.

Contents

1. Introduction
   Definitions, key components, functional subsystem, Raster data model, vector data model, attribute model, Data acquisition techniques, data sources, data capturing techniques and procedures, data visualization of spatial data, layers, projections and transformation and datum.
2. Map design
   Symbols to portray points, lines, polygons and volumes,graphic variables, visual hierarchy, Data classification graphic approach, mathematical approach.
3. Spatial analysis
   Neighborhood functions, network, and overlayanalysis, buffering, spatial data quality, components of data quality, micro level components, macro level components, usage components, sources of errors, accuracy and resolution and uncertainty.
4. GIS Applications

Lab. Work

Introduction to GIS Lab (hardware/ software), Raster/ Vector/ Attribute Data Display, Scanning, Digitization, coordinate based point mapping, Raster/ Vector Conversion.

Recommended Texts

1. Chang, K.. (2006). *Introduction to geographic information systems*. Boston: McGraw-Hill Higher Education .
2. Demers, M.N. (2002). *Fundamentals of geographic information systems*. New York: John Wiley & Sons.

Suggested Readings

1. Yeung., Lo, C.P. & Lal, A. K. (2003). *Concepts and techniques of geographic information system.* New Dehli: Prentice Hall.
2. Kiser, J.D., & Paine, D.P., (2003). *Aerial photography and image interpretation*, New York: John Wiley & Sons.
3. Janssen, L. L., &Huurneman, G. (2000). *Principles of remote sensing*: ITC, International Institute for Aerospace Survey and Earth Sciences.

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GEOG- 6313 **Environmental Geography** **3(3+0)**

Environmental Geography, one of the most traditional parts of the discipline of Geography, encompasses natural science, social science, and humanistic understandings of the Earth's environment. Environmental Geographers study the complex relationships between humans and the natural environment over time and through space. This course will provide a historical, geographical, and humanistic foundation for understanding the environment and the plethora of environmental issues that confront us at the beginning of this century. It is a major aim of this course to produce environmentally aware students and to equip them with skills to enable them to become future decision-makers on environmental matters in whatever field they wish to pursue in the future. By studying this course students will be able to recognize what the issues are, and to view them from a geographic perspective. They will recognize the responsibilities they have in relation to other people, the environment, and sustainability, and there will be opportunities to initiate personal action.

Contents

1. Evolution of Environmental Studies in Geography
2. Comparative Advantage of Geography
3. Concept of environmental management
4. Environment and Man interaction, Ecosystem, natural resources
5. Important Cycles
6. Population explosion, The human impact on the environment
7. Environmental hazards, Types of Hazards
8. Major Environmental hazards and Problems in Pakistan: Floods, Earthquake, Tsunami, Cyclones, Landslides, Droughts, Deforestation and Desertification
9. Water-logging and Salinity
10. Soil Erosion
11. Global Warming and ozone depletion
12. Environmental Pollution , Waste Management, Control and Mitigation Measures, Technology, awareness, Legislation, Ethics
13. Pakistan Environmental Act
14. National Conservation Strategy
15. National Environmental Quality Standard

Recommended Texts

1. Arms, K. (2001). *Environmental science*. Philadelphia: Asunders College Publishing.
2. Basak, A. (2009). *Environmental studies*. New Delhi: Pearson.

Suggested Readings

1. Botkin, D. B. & Edward A. K. (2012). *Environmental science*. Hoboken: John Wiley & Sons.
2. Burton, I. R., W. Kates& Gilbert. F. W. (2000). *The environment as hazard*. Karachi. Oxford University Press.
3. Cunningham, W. P. (2007). *Environmental science: a global concern*. Boston: McGraw-Hill Higher Education.

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GEOG -6314 **Urban Geography** **3(3+0)**

This course explores the setting in which more than half of the world's people live--the city. Cities are the largest human artifacts, but how do they emerge and evolve? What are the similarities and differences between cities? Why is the Central Business District of some cities thriving while others decline? These and many other questions are examined by urban geographers. This course will explore and analyze the various aspects, concepts and approaches of urban geography. The course will cover topics such as historic and contemporary urban development; spatial dimensions of the city; social and economic patterns; images of the city; inequality and the development of urban built environment. Throughout history, cities have been the centers of economic, political, and cultural life. Further, many of the critical issues of our time--social polarization, economic restructuring, environmental degradation, and poverty--are concentrated in urban areas. This course explores the relationships among cities in a global urban system as well as the internal spatial arrangement of cities. It asks questions about how people structure the spaces of cities as well as about how people's lives are affected by the ways cities are structured.

Contents

1. Origin of towns.
2. Site and situation concept.
3. Process of urbanization in the world.
4. Urban function, economic base of urban centers.
5. Formal and functional classification of towns
6. Towns as central place
7. Urban hinterland.
8. Urban structure-different theories
9. Hierarchy of settlements-city size distribution
10. Rank size Rule
11. Law of primate city.
12. Urban expansion, metropolitan decentralization
13. Rural urban fringe-urban social life.
14. Concept and principles of Planning.
15. History of Town Planning-ancient and medieval Modern Planning-urban development urban renewal neighbourhood planning.
16. A study of the process of urbanization in Pakistan.
17. Urban Slums
18.

Recommended Texts

1. Pacione, M. (2013). *Urban geography: A global perspective*. Routledge.
2. Wheeler, J. O., & Holloway, S. R. (2004). *Urban geography*. John Wiley & Sons Inc.

Suggested Readings

1. Douglas, I., Goode, D., Houck, M., & Wang, R. (Eds.). (2010). *Handbook of urban ecology*. Routledge.
2. Mayer H.M. & Kohn C.F. (2000). *Readings in urban geography*. Chicago: University of Chicago Press.
3. Smailes, A.E. (2000). *The geography of towns*. London: Hutchinson and Co.

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GEOG -6315 **Digital Image Processing** **3(2+1)**

It describes knowledge about knowledge about Digital Image processing (DIP) and its practical implementation. To produce students, that has applicable knowledge about basic tools of image processing and sensor's system. The course aims to equip students with overview of digital image processing including visual perception, image formation, spatial transformations, image enhancement, color image representation and processing, edge detection, image segmentation, and morphological image processing. Since 1964 the advent of large-scale digital computers and the space program have made digital image processing one of the most rapidly growing fields in electrical engineering. Now image processing has found much more wide applications not only in the space program, but also in the areas such as medicine, biology, industrial automation, astronomy, law enforcement, defense, intelligence. With the progress made in multimedia these days, digital image processing finds more wide applications. It has become an indispensable part of our digital age.

Contents

1. Multispectral, Thermal and Hyperspectral Scanning
2. Satellite Systems
3. Digital Image Processing and Image Enhancement
4. Introduction, Image Rectification and Restoration, Image Enhancement, Contrast Manipulation
5. Spatial Feature Manipulation, Multi-Image Manipulation
6. Image Classification
7. Data Merging and GIS Integration
8. Geometric Image Correction, Spectral Image Enhancement, Spatial Image Enhancement - Operations in Spatial Domain, Spatial Image Enhancement - Operations in Frequency Domain
9. Image Classification – Supervised and Unsupervised Classification
10. Image Classification - Object Oriented Classification
11. Microwave Sensing
12. Application of Remote Sensing
    Land Cover Mapping, Land use change monitoring, Urban expansion Mapping, Environmental Monitoring, Cadastral Mapping

Lab. Work

Advanced Image processing on MATLAB, ERDAS IMAGINE, ENVI

Recommended Texts

1. Lilles T. M. & Kiefer, R. W. (2004).*Remote sensing and image interpretation.* New York: John Wiley & Sons.
2. Campbell, J. B. &Wynne, R. H. (2011).*Introduction to remote sensing.* New York: Guilford Press.

Suggested Reading

1. Lo, C. P. (2000). *Applied remote sensing.* Essex: Longman.
2. ITC (2004). *Principles of remote sensing.* ITC Educational Textbook Series. Enschede, The Netherlands.
3. Muralikrishna, I. V. (1992). *Remote sensing applications and geographic information systems.* New Delhi: McGraw Hill.

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GEOG - 6316 **Geography of Pakistan** **3(3+0)**

Pakistan Geography is a vital topic for study because it allows a student to understand the planet in a way that clarifies various global political issues and to see the relationship between people, groups and the physical environment in which they live. Geography gives us information about various types of climates, natural conditions, mineral wealth etc. of the various nations. As the world becomes more interrelated and interdependent through technological advances, it is increasingly important to understand the physical and cultural differences of other places. Studying of Pakistan geography also opens a link to understanding the history of one's own culture, as well as that of others. An understanding of geography also allows one to make smart choices when dealing with issues regarding the relationship of society to the physical environment.

Contents

1. Introduction
2. Geo-strategic position of Pakistan
3. Location and Geographical significance
4. Geo-political Importance
5. Administrative setup
6. Land and Physical Environment:
7. Physiography
8. Climate and climatic regions o Hydrology
9. Soils and vegetation
10. The People
11. Population characteristics: structure, composition and distribution
12. Population Change
13. Urbanization
14. Economy
15. Agriculture (crops and livestock)
16. Irrigation
17. Power and mineral resources
18. Industries
19. Trade
20. Tourism
21. Transport and Communication
22. Major challenges of Pakistan
23. Water, power, security and environmental issues

Recommended Texts

1. Khan, F. K. (2015). *Geography of Pakistan.* Karachi: Oxford University Press.
2. Ahmad, K. S. (2000). *Geography of Pakistan.* Karachi: Oxford University Press.

Suggested Readings

1. Burkey, J. S. (1991). *Pakistan the continuing search for nationhood.* Oxford: Western Press Oxford.
2. Davidson, A. P. & Ahmad, M. (2003). *Privatization and the crisis of agricultural extension: the case of pakistan, king's soas studies in development geography.* New Delhi: Ashgate Publishing.
3. Tayyeb, A. (2000). *A political geography of Pakistan.* Oxford: Oxford University Press.

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GEOG - 6322 **Cultural Geography** **3(3+0)**

This course provides an overview of the field of cultural geography. This area of study centers its attention on spatial variations among cultural groups and the special functioning of society, and the changing and multifaceted relationships between people and the environments in which they reside. Students will learn the basic geographical tools and concepts needed to understand the intricacy of spaces and areas and to appreciate the interconnections between their lives and those of people in different parts of the world. The course provides knowledge of and about the creation of places and regions, an understanding of both the interdependence of places and regions in globalizing world, and the major changes that have taken place in global, regional, and local landscapes.

Contents

1. Introduction
2. Definition of Culture & Cultural Geography, Scope of Cultural
3. Geography & its relationship with other Disciplines.
4. Basic themes of cultural geography:
5. Cultural Ecology
6. Cultural Diffusion
7. Cultural Regions/Area
8. Cultural Integ. ion
9. Cultural Landscape.
10. Cultural History:
11. Paleolithic Age: Hunting & Gathering Culture
12. Neolithic Age: Agricultural World Revolution.
13. Industrial Revolution & Urbanization
14. Detailed Study of Stages of Social Cultural Change
15. Geo-Cultural Study of the following:
16. Religion
17. Language
18. Rural & Urban Communities
19. Study of Pakistani Culture:
20. History, Present Patterns and Future Prospects.
21. Current Issues:
22. Terrorism, Green Politics, Globalization, Human rights Revolution of Information, Gender Geography and Cultural problems.

Recommended Texts

1. Fouberg, E. H., Murphy, A. B., & De Blij, H. J. (2009). *Human geography: people, place, and culture*. New York: John Wiley & Sons.
2. Terry G. J. Lester R. (2000). *Human mosaic*. New York: Harper Collins Publishers.

Suggested Readings

1. Atkinson, D., Jackson, P., Sibley, D., &Washbourne, N., (2005). *Cultural geography: A critical dictionary of key ideas*. IB Tauris.
2. Anderson, K., Domosh, M., Pile, S., & Thrift, N., (2002). *Handbook of cultural geography*. Singapore: Sage.
3. Horton, J., & Kraftl, P., (2013). *Cultural geographies: An introduction*. London: Routledge.

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GEOG - 6323 **Natural Hazards and Disaster Management** **3(3+0)**

This course covers the mitigation concepts, implementation approaches planning and types of Hazards. It is a multidisciplinary research oriented subject for planning and development. This is a course on applied hazard mitigation, but because it is a graduate level course, the focus will not be only on the fundamentals of hazard mitigation but on the fundamentals and their application. Students have had some introduction to hazard mitigation through NHDM. The application aspect of this course addresses the relationship of hazards and their behaviors which cause disasters and how local, state, and federal emergency management agencies can mitigate the potential threats. Hazard mitigation is actually hazards management, much like emergency preparedness, response, and recovery have to with disaster management. Thus, in emergency management we deal with both hazards and disaster management. The approach used in this present course is to address hazards management or the management of hazards so that future disaster impacts will be reduced or eliminated.

Contents

1. The Concept
2. The Nature of the Phenomena
3. Dynamics of Potentially Disastrous Natural Hazards
4. Impact of Natural Hazards and Likely Disasters
5. Scale
6. Risks
7. Vulnerability
8. The Disaster Management Cycle
9. Application of RS, GIS, GPS Tools in the Management of following Natural Hazards / Disasters
10. Flood
11. Earthquake
12. Cyclones
13. Rainfall
14. Efficacy of the Integrated Development Planning and Natural Hazards/ Disasters

Recommended Texts

1. Bryant, E. (2005). *Natural hazards*. Cambridge: Cambridge University Press.
2. Cochrane, M.A. (2009). *Tropical fire ecology: climate change, land use and ecosystem dynamics*. Springer: Praxis Publishing.

Suggested Readings

1. Ghosh, G.K. (2006). *Disaster Management*. New Delhi: A.P.H Publishing Corporation.
2. Pirarizy, A.A. (2002). *Environmental Geography and Natural Hazards*. New Delhi: A.P.H Publishing Corporation.
3. Smith, K. (2004). *Environmental Hazards. Assessing Risk and Reducing Disaster*. London: Routledge.

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GEOG - 6324 **Geography of Manufacturing** **3(3+0)**

The term "manufacturing" includes those activities by which man changes the form or nature of raw materials, converting them into more useful products. The course focuses on explanations of factory location, the role of location in corporate strategies and the geographical structure of production systems, including industrial districts. Particular attention is paid to the organizational structure of the economy, especially the dominant role played by multinational firms (MNCs), and the forces that shape the agglomeration and dispersal of activity. These transforming operations are conducted in factories, to which are brought raw materials from various source regions and from which go finished products to diverse market regions. Factories which characterize industrial regions may be interrelated: some may supply semi-finished items to other factories; others may be branch plants; and still others may have a service relationship, such as a power plant, which supplies electrical energy to other factories. A relationship also exists between factories and non-factory elements.

Contents

1. Introduction to Geography of Manufacturing:
2. Definitions and concepts, and organization.
3. Classification of industrial activities.
4. Historical Development of Industrial Activity:
5. From industrial revolution to green paradigm.
6. Modern trends in manufacturing.
7. Industrial Location:
8. Approaches to location dynamics.
9. Location factors.
10. Location models.
11. Location theories.
12. Geographical Analysis of Selected Industries:
13. Light industries (Cotton textiles, sugar industry)
14. Heavy industries (Iron and steel, petro-chemicals, cement)
15. Modern Issues in Manufacturing:
16. Patterns of international production and the industrialization process.
17. De industrialization.
18. Industry and environmental problems.
19. Industrial planning and management.

Recommended Texts

1. Alexanderson, G. (2000). *Geography of manufacturing*. Englewood Cliffs: Prentice Hall Publications.
2. Altaf, Z. (2000). *Entrepreneurship in the third world risk and uncertainty in industry in Pakistan*. London: Croom Helm, Ltd.

Suggested Readings

1. Chapman, K. & Walker, D.F. (1991). *Industrial Location*. (2nd ed.). Oxford: Wiley Eastern Ltd.
2. Emery, J.S. & Shaw, J.H. (2000). *Cities and Industries*. Milton: Jacaranda Press.
3. Hayter, R. (2000). *The Dynamics of Industrial Location*. New York: John Wiley & Sons.

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GEOG - 6325 **Hydro Geography** **3(3+0)**

It describes advanced knowledge about Water resources, water resource management. Hydrology, distribution and availability of water. This course provides a basic introduction to hydrologic processes, including fundamentals of hydrology, rainfall-runoff modeling, hydraulic processes (including both pressurized pipe flow and open channel flow), and hydrologic frequency analysis. These fundamentals are then applied in the computation of design flows and in the analysis and design of hydraulic systems such as pipe networks and storm water management systems. Computational laboratory sessions (including geographic information systems and simulation models) and experimental laboratory sessions reinforce lectures and provide hands-on learning opportunities. By the end of this course, students should be able to apply standard techniques, computational tools, and data used by engineers in conducting hydrologic analysis.

Contents

1. Introduction
2. Hydrological Cycle and Water Balance: Water Reservoirs, Hydrological Cycle, Water Balance
3. Precipitation and Rainfall
4. Runoff: Factor affecting the Runoff, Runoff Cycle and Phases of Runoff, Measurement of Runoff
5. Ground Water
6. Floods: Causes and Seasonal Distribution of Floods, Flood Protection and Planning, Geographical Distribution of Floods
7. Glacial Water: Glacial Nourishment and Wattage, Glacial Runoff, Glacial Flow, Response of Glacier to Climatic Changes
8. Droughts: Extent and Distribution of Droughts, Drought Severity, Frequency and Duration, Hydrological Relations in Draughts
9. Lakes: Origin and Diversity, Hydrological Cycle and Water Balance Lakes, Geographical Distribution
10. Water Pollution: Classification of Water Pollutants, Extent and Distribution of Water Pollutants, Effects of Water Pollution on Fauna and Flora
11. Quantitative Hydro Geography: Basis Concepts, Areal Aspects of Drainage Basins
12. GIS and RS Application:

Recommended Texts

1. Raghunath, H. M. (2006). *Hydrology: principles, analysis and design*: New Age International.
2. Ward, R.C. & Robinson, M. (2000). *Principles of hydrology*. London: McGraw Hill.

Suggested Readings

1. Bittinger, M. W (2000). *Water resources, use, and management.* Proceedings of a symposium held at Canberra. Edwin S. (Hill, Eds). Cambridge: Cambridge University Press.
2. Meinzer, O.E. (2000). *Hydrology*. New York: McGraw Hill.
3. Chow, V. T. (2000). *A handbook of applied hydrology.* New York: McGraw Hill.

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GEOG -6326 **Medical Geography** **3(3+0)**

Medical geography is an important "new" area of health research that is a hybrid between geography and medicine dealing with the geographic aspects of health and healthcare. Medical geography studies the effects of locale and climate upon health. It aims to improve the understanding of the various factors which affect the health of populations and hence individuals. It is also called health geographics. Focuses on the design of GIS-based models to address health and healthcare issues. Topics include a conceptual framework, landscape epidemiology models, disease diffusion models, health accessibility, human health behavior and location-allocation of health services. Laboratory section provides hands-on experience applying these models with GIS tools.

Contents

1. Introduction to Medical Geography:
2. Definitions, themes, concepts, Nature & scope of Medical Geography
3. The Historical Development of Medical Geography
4. The status of Medical Geography.
5. Factors inflecting the Patterns of Health & Disease:
6. Geographical Factors.
7. Physical Factors / Environmental Factors.
8. Cultural Factors.
9. Socio – Economic & Political Factors.
10. Patterns & Processes of Health & Disease:
11. Spatial variations in health & welfare patterns.
12. Role of Geography in exploring the impacts of diseases.
13. Models in Medical Geography
14. Epidemiological Transition
15. Health & inequalities
16. Inverse care la[illegible].
17. Global Patterns of health & Disease.
18. Global Eradication of disease.
19. Progress in Medical Geography:
20. Recent Issues & Developments in Medical Geography.
21. GIS, Remote Sensing & Health studies.
22. Changing Societies & future Health care.
23. Geography, Health care & Planning.

Recommended Texts

1. Lloyd, J. (200_). *Health & welfare*. London: Holder & Stoughton.
2. Izhar, F. (2004). *Geography & Health: A study in medical Geography*. New Delhi: A.P.H. Publishing Corporation.

Suggested Readings

1. Leninan, J. & Fletcher, W.W. (2000). *Health & the environment* (1st ed.). Glasgow: Blacker & Sons Ltd.
2. Lloyd, J. (2002). *Health & welfare*. Holder & Stoughton London.

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GEOG –6327 **Political Geography** **3(3+0)**

Political geography is concerned with the study of both the spatially uneven outcomes of political processes and the ways in which political processes are themselves affected by spatial structures. In this course, we will survey Political Geography, a subfield of Human Geography which focuses on questions of space and power and the interconnections of geography and politics. All politics are geographical, from the spatial arrangement of local governments to the territorial basis of international trade. We will explore how politics works with a concern for where political impacts occur at a variety of geographical scales (from the international to the local) while also considering how geographical factors impact political actions. We'll also examine the geography of various formal institutions and practices of politics as well as the informal politics of everyday life within places. In short, we'll explore how political power makes geographies and how, in turn, geography may be said to make politics.

Contents

1. Nature and objectives of Political Geography, Definition and development of political geographic thought.
2. A critical examination of the following:
3. Concept of environmental relationship in political geography.
4. The concept of geopolitics its development and short-comings
5. National deterministic theories of Germans and French possibilities.
6. State as a Politico-geographic Phenomenon:
7. Concept of the state and its classification. Chief political-geographic characteristics of states.
8. Hierarchy of political area.
9. Frontiers and boundaries: their concepts, functions and classification.
10. Core areas, ecumenical area and capitals.
11. Approaches and forces in the politico geographic study of state:
12. A critical examination of the following approaches:
13. Simple descriptive approach.
14. Historical approach.
15. Morphological approach.
16. Functional approach.
17. Forces affecting the internal functioning of a state:
18. Factors affecting the external relations of a state:
19. A study of the foreign relations of the following states in relation to the above factors:
20. U.SA. U.K, Russia, China, A detailed political geographical study of Pakistan
21. World Organizations

Recommended Texts

1. Jones, M., Jones, R., Woods, M., Whitehead, M., Dixon, D., & Hannah, M. (2014). *An introduction to political geography: space, place and politics*. London: Routledge.
2. Kruys, B. G. G. (2002). Controlling land borders: A comparison of the United States of America, Germany and South Africa. *Strategic review for southern Africa*, *24*(2), 114.

Suggested Readings

1. Agnew, J. (1997). *Political geography: a reader*. London: Arnold.
2. Bakis, H. (1995). Communication and Political Geography in a Changing World' *Revue Internationale de Science Politique, 16* (3). 219–311.
3. Williams, N. (2009). *Border Politics: The limits of sovereign power: the limits of sovereign power*. Edinburgh: Edinburgh University Press.

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GEOG - 6328 **Regional Planning & Development** **3(3+0)**

Regional planning deals with the efficient placement of land-use activities, infrastructure, and settlement growth across a larger area of land than an individual city or town. Regional planning is a sub-field of urban planning as it relates land use practices on a broader scale. This course will explore and analyze the various aspects, concepts and approaches of urban geography. The course will cover topics such as historic and contemporary urban development; spatial dimensions of the city; social and economic patterns; images of the city; inequality and the development of urban built environment. It also includes formulating laws that will guide the efficient planning and management of such said regions. Regions require various land uses; protection of farmland, cities, industrial space, transportation hubs and infrastructure, military bases, and wilderness. Regional planning is the science of efficient placement of infrastructure and zoning for the sustainable growth of a region.

Contents

1. Principles and Scope of Planning and Development
2. Planning: A Geographer's View, ii. Planning Processes
3. Planning as an Activity
4. Objectives in Planning
5. Objectives of Regional Development Efforts.
6. Implications of Regional Development:
7. Defining Regions, ii Regional Hierarchy and Classification, iii. Regionalism or Administrative Boundaries?, iv. Determining Regional Boundaries, v. Factors contributing to Uniformities and Disparities in Regions, vi.
8. Resources and Planning:
9. The Resource Base.
10. Resource Evaluation.
11. Utilization of Resources for Planning and Development.
12. Urban and Regional Planning:
13. Urban Growth Patterns.
14. Impact of Industrialization.
15. Planning for Cities and City Regions.
16. Rural Planning:
17. Agricultural Planning and Rural Development.
18. The Human Factor in Agricultural Development.
19. Examples of Urban/Rural/Regional Planning with Special Reference to Pakistan:
20. Kulu Region.
21. Multan-Bahawalpur Region
22. Sargodha Region.
23. Barani Region.
24. Students shall be required to choose a region and develop conceptual hierarchy and planning models for the region. The report shall accompany all regional data with a master regional plan.

Recommended Texts

1. Hall, P. (2000). *Urban and regional planning* (2nd ed.). London: Allen &Unwin.
2. Hudson, R. & Lewis J.R. (2000). *Regional planning in Europe*. London: Pion Ltd.

Suggested Readings

1. Birmingham, W., & Ford, A.G., (2000). *Planning and growth in rich and poor countries*. London: George Allen and Unwin Ltd.
2. Cox, K. R. (2000). *Location and public problems*. Oxford: Basil Black-Well.
3. Frey H. (1999). *Designing the city towards a more sustainable Urban Form*. London: Routledge.

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GEOG-6329 **Climate change Studies** **3(3+0)**

The purpose of climate change studies is multi-faceted and driven by the urgent need to understand, address, and mitigate the challenges posed by climate change. Climate change studies aim to deepen our understanding of the Earth's climate system and the factors driving climate change. Climate change studies assess the potential impacts of changing climate conditions on various natural and human systems. Climate change studies contribute to the development of adaptation strategies that help societies and ecosystems cope with the impacts of climate change. It also plays a crucial role in identifying and assessing mitigation strategies to reduce greenhouse gas emissions. Climate change studies provide scientific evidence and insights to inform policy development and decision-making processes at all levels, from local to global.
Overall, the purpose of climate change studies is to provide knowledge, evidence, and strategies that can inform decision-making, promote sustainable development, and help societies and ecosystems adapt to and mitigate the impacts of climate change.

Contents

1. Introduction
2. Climate systems, Mechanisms of climate change, Paleo-climate
3. Internal Forcing Mechanism, External Forcing Mechanism
4. Melankovitch cycle, Seasonal variation
5. Natural variability of climate
6. Extreme Events Tornadoes and Hurricanes, Thunderstorm Hazard
7. Global warming, Ozone depletion, Green House effect, Carbon Cycle Global Perspective
8. Currents of Pacific, Atlantic,& Indian Oceans, Effects of Currents on Climate change
9. Climatic Regulation Organization and Policies.
10. UNFCCC, IPCC, Assessment reports brief Discussion
11. Weather. Modification and Atmospheric Optics
12. NOAA, WMO, Moisture & precipitation process, Thermohaline, &Atmospheric circulation
13. El-NINO , Global Impact s of EL-NINO
14. Regional patterns of climate variability
15. North Atlantic Oscillation (NAO), Atlantic Multi-decadal Oscillation (AMO)
16. Pacific Decadal Oscillation (PDO), Indian Ocean Dipole (IOD)
17. Madden Julian Oscillation, Arctic and Antarctic Oscillation
18. Latitudinal variation of climate, Measurement of climate
19. Global system of climate change, Global and hemispheric variability
20. Climate Change Impacts in Pakistan, Climate change mitigation
21. Climate change Impacts, Economic, Health, Agriculture

Recommended Books:

1. Barnes, J., & Dove, M. R. (Eds.). (2015). *Climate cultures: Anthropological perspectives on climate change*. Yale University Press.
2. Marselle, M. R., Stadler, J., Korn, H., Irvine, K. N., & Bonn, A. (2019). *Biodiversity and health in the face of climate change* (p. 481). Springer Nature.

Suggested Books:

1. Hughes, S., Chu, E. K., & Mason, S. G. (2020). *Climate change and cities*. Oxford: Oxford University Press.
2. Weintrobe, S. (Ed.). (2013). *Engaging with climate change: Psychoanalytic and interdisciplinary perspectives*. Routledge.

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GEOG - 6330 **Agricultural Geography** **3(3+0)**

Agricultural geography is a sub-discipline of human geography concerned with the spatial relationships found between agriculture and humans. Agricultural Geography provides the basic information of various types of the agriculture on the earth surface viz., Subsistence, commercial, horticulture, specialised etc. Agricultural Geography as a sub-discipline of human and economic geography. The geography of human activities is called as 'economic geography' which examines the primary, secondary, tertiary and quaternary activities of man. Man in his primeval stage was a hunter and gather and during the Neolithic period he learned the art of cultivation of crops. Thus, agriculture had been the dominant economic activity in the past and it is still the mainstay of over two-third of the world population. The study of agricultural geography is thus of great social relevance among all the branches of human geography

Contents

1. Introduction to agricultural geography:
2. Nature and scope
3. The origins and development of agriculture
4. Theoretical aspects of geographical location relevant to agriculture
5. Introduction; approaches to the study of agriculture in geography
6. Approaches: commodity, regional, deterministic, systematic
   factors influencing agricultural patterns:
7. Physical factors: the terrain, climate, soil, water resources
8. Socio-economic factors: technological, population, cultural, infrastructure
9. Land, labour and capital
10. Government and regional policies, models in agricultural geography:
11. The nature and need of models
12. Classification of models
13. Models of agricultural activity, agricultural regions: concepts and techniques:
14. Concept and methodology
15. Techniques: normative, empirical, single element, statistical
16. Methods of agricultural regionalization
17. Data classification and distribution
18. Agricultural types
19. Agricultural systems of the world, field studies and surveys:
20. Land use survey: techniques of land use survey
21. Land capability survey
22. Land suitability evaluation survey
23. Land classification

Recommended Texts

1. Newbury, P. A. R. (1999). *Agricultural geography*. London: Longman.
2. Shukla, L. (2011). *Readings in agricultural geography*. Jaipur: Scientific Publisher.

Suggested Readings

1. Laingen, C. & L. Butler, H. (2013). *Agricultural geography*. Oxford Bibliographies. Oxford: Oxford University Press. DOI 10.1093/OBO/9780199874002-006
2. Bowler, I. R. (2002) *The industrialization of Agriculture*. Oxford: Oxford University Press.
3. Singh, J. & Dhillon, S. S. (2000). *Agricultural geography*. New Delhi: McGraw-Hill.

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GEOG - 6331 **Conservation of Resources** **3(3+0)**

Natural resources conservation workers strive to protect natural resources, such as water, soils, minerals, forests and wildlife. Studies in natural resources conservation are multidisciplinary, covering topics in resource management, recreation, development and ecosystems. Conservation includes both the protection and rational use of natural resources. Earth's natural resources are either nonrenewable, such as minerals, oil, gas, and coal, or renewable, such as water, timber, fisheries, and agricultural crops. We need to conserve our Natural Resources because it is the main source of our daily needs. We need to conserve it because they are limited only. And if these resources are abused and harmed, we will have short quantity of sources for food and living. Remember our future generation will need also our Natural Resources.

Contents

1. Scope of the subject; its importance, problems created by the expanding population
2. Advancing technology, increasing standings of living and greater demand for space and goods thereof
3. Relation of subject to other disciplines.
4. Agricultural Resources,
5. Agriculture and man. Types of agriculture, agricultural land use and cropping pattern. Efficiency of agriculture, problems relating to agricultural land. Agricultural regions of the work.
6. Animal Resources:
   Ranching and pasture, problems of overgrazing, carrying capacity of land, recent changes in ranching brought about by scientific agriculture feedlots and custom feeding, modern range management.
7. Problems of Human Population:
   Population distribution in different ecosystems, and different societies (with different technical skill), rate of growth of population. Relationship between man, his skills and natural resources. Rural land planning in developed and developing countries. Differences in interpretation of resources. Control of population size, dangers of over population.

Recommended Texts

1. Bert, R. (2006). *Infrastructure: the social value of shared resources*. New York: Oxford University Press.
2. Dunster, K. (2011). *Dictionary of natural resource management*. Amsterdam: UBC press.

Suggested Readings

1. Coutts, C. (2016). *Green infrastructure and public health*. London: Routledge.
2. Niles, E. (2003). *Life on earth: An encyclopedia of biodiversity, ecology, and evolution*. California: ABS-CLIO.
3. Burley, J. (2004) *Encyclopedia of forest sciences*. New Dehli: Academic Press.

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GEOG -6370 **South Asia** **3(3+0)**

South Asia, which contains nearly a quarter of the world's people, refers to the countries comprising the South Asian subcontinent: Bangladesh, Bhutan, India, Nepal, Pakistan, Sri Lanka, Maldives, and sometimes. The purpose to understand of the concentration is to provide cross-cultural interdisciplinary understanding of a complex civilization that is both ancient and modern, and of great significance in the contemporary world. In this course, interdisciplinary in scope, we will explore connections among religion, literature, social organization, and film in the formation of cultures in South Asia. The course will introduce representative themes and debates from a range of temporal, geographical, and social locations in South Asia and invite attention to their impact on the rest of the world.

Contents

1. Introduction and History of South Asia
2. Geo-political importance of south Asia
3. Mountain of South Asia
4. Plains
5. Deserts
6. River and Lakes
7. Coastal area
8. Plateau
9. Religion
10. Language
11. Culture
12. Agriculture (Irrigation system and crops)
13. Industries
14. Poverty of Gender
15. Forest Distribution
16. Minerals
17. Climate

Recommended Texts

1. Clothey, F. W. (2007). *Religion in India: A historical introduction*. New York: Routledge.
2. Yogendra, K., & Malik, A. (2009). *Government and politics in South Asia* (6th Ed.). Boulder: Col. Westview Press.

Suggested Readings

1. McCloud, D. G. (2018). *Southeast Asia: tradition and modernity in the contemporary world.* New York: Routledge.
2. Fred W. (2007). *Clothey, religion in India: a historical introduction.* Glasgow: Blacker & Sons Ltd.
3. Yogendra, K., & Malik, A. (2009). *Government and politics in South Asia*. Boulder: Col. Westview Press.

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